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EXAMINER

FERRIS III, FRED O

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 08/28/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/406,663

Applicant(s)

KNEBEL ET AL.

Examiner

Fred Ferris

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 June 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 September 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. *Claims 1-43 have been presented for examination based on applicant's amendment filed 1 June 2003 (paper # 4). The examiner has maintained the rejection of claims 1-43.*

### **Response to Arguments**

2. *Applicant's arguments filed on 1 June 2003 (paper # 4) have been fully considered.*

*Regarding applicant's declaration filed 1 June 2003 (paper #5): Applicants have submitted Declarations (paper #5) from the inventors relating to the publication date (Exhibit A) and inventorship (Exhibit B) of the cited reference "Diagnosis and Characterization of Timing-Related Defects by Time-Dependent Light Emission", D. Knebel et al. While the declaration is defective, since it is not signed by all of the inventors, and while applicants have not provided the publishers publication date as evidence, the examiner nonetheless will assume for purposes of argument that the publication date of this reference is October 1998. However, the examiner questions the validity of the declaration (Exhibit B) since it includes only the inventors listed on the present invention and does not include all authors listed on the publication. Since the cited reference is disclosed by a different inventive entity (others) than that of the claimed invention, it qualifies as prior art under 102(a).*

Regarding applicant's response to 112(2) rejection: Applicants have amended claims and presented persuasive arguments regarding the 112(2) rejection:

Accordingly, the examiner withdraws the 112(2) rejection of claims 1, 8, 9, and 39.

Regarding applicant's response to 102(b) rejections: As cited above, the examiner assumes for purposes of argument that the publication date of the Knebel reference is October 1998. Accordingly, the examiner withdraws the 102(b) (Knebel) rejections and now rejects claims 1-7 and 10-43 under 102(a). (see 102(a) rejection below) Per the 102(b) Dangelo et al and Rowson rejections: Applicant's argue that Dangelo and Rowson do not disclose the "visualization of causal relationship information" about the expressed device activity, and does not disclose a system for visualizing a simulation of "optical emission". The examiner asserts that terms "causal relationship information" and "optical emission" are not defined by the claims. Limitations relating to "optical emission" simulation do not appear in the independent claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicants appear to be attempting to argue limitations from the specification that have not been specifically claimed. Accordingly, the examiner interprets the limitations relating to representing the expressed activity using a defined representation to "illustrate causal relationship information" to be equivalent to visualizing the operation of a circuit by obtaining device activity from simulated activity and visually displaying results as disclosed by Dangelo and Rowson. (see

102(b) rejections below) The examiner therefore maintains the 102(b) rejections as cited below.

The examiner also notes that applicants appear to have intended that claims 40-43 depend from independent claim 39. (see paper #4, page 11, line 6) However, as currently written, claims 40-43 are dependent from dependent claim 36.

### **Drawings**

3. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-7, and 10-43 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by “Diagnosis and Characterization of Timing-Related Defects by Tim -Dependent Light Emission”, D. Knebel et al, International T st Conference, IEEE, October 1998.**

Regarding independent claims 1 and 39: Knebel discloses visualizing circuit operation by picosecond imaging circuit analysis (PICA) as follows:

**Visualizing circuit operation:** (Figs. 2-7, pp734-735)

Obtaining **device activity** by **measure/simulated** activity: (Figs. 1, 6, 8, pp736-737)

Expressing **device activity** in **representation**: (Figs. 4-9, pp735-737)

Representing activity in **visual form**: (Figs. 5, 6, pp737)

Also see: (Abstract, Introduction, Background, Conclusions)

Regarding dependent claims 2-7, 10-38 and 40-43: Claims 2-7 and 40-43 relate to visualizing device activity, simulation of emissions, and measuring and displaying sequences. (See: Figs. 1-9, pp734-737) Claims 10-13 and 24-26 merely relate to features available with any commercially available CAD package (OrCAD, etc.) and are considered by the examiner to be inherent to Knebel. (See: Figs. 3-8, pp735) Claims 14-19 and 30-35 relate to timing, switching, and emissions modeling. (See: Figs. 4-6, 8, pp735, 737) Claims 20-23, 27 and 28 relate to simulation of emissions. (See: Figs. 8, 9, pp737) Claims 29, and 36-37 relate to test pattern (vector) and device activity. (See: Fig.1, pp735)

**Claims 1, 2, 3, 6, 7, 14, 15, 28, 32, 33, 39, 40 and 41 are also rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent 5,555,201 issued to Dangelo et al.**

Independent claim 1 and 39 are drawn to:

Method and means for visualizing circuit operation by:

Obtaining device activity by measure/simulated activity

Expressing device activity in representation

Representing activity in visual form

Regarding independent claims 1 and 39: Dangelo discloses **visualizing the operation of a circuit** by obtaining **device activity** from **measured or simulated** activity and **visually displaying results** representing the device activity. (Abstract, Summary, CL22-L55, CL24-L58, CL28-L28, CL32-L62, Figs. 8, 9, 13-15, 18-20, 25)

Regarding claims 2, 3, 6, 7, 14, 15, 28, 32, 33, 40 and 41: Dangelo also discloses sequence relationships (Figs. 13-15), IC CAD viewer (Figs. 18, 19), sequence graph (Figs. 13-15), simulated activity (events/states) (Figs. 8, 9, 13-15, 18-20, 25), switching events (Figs. 18, 19), switching behavior from netlist (Figs. 2, 8, 9), waveform transitions (Figs 18, 19).

**Claims 1, 8, 9, and 39 are further rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent 5,251,159 issued to Rowson.**

Regarding independent claims 1 and 39: Rowson discloses **visualizing the operation of a circuit** by obtaining **device activity** from **measured or simulated** activity and **visually displaying results** representing the device activity. (Abstract, Summary, CL2-L11-18, CL3-L13-23, 30-42, 43, 45-61, 65, CL5-L33-45, Figs. 1, 4, 5)

Regarding dependent claims 8 and 9: Rowson discloses a visual form of **animation** of the device activity. (CL30-L66, CL5-L34, Figs. 4, 5)

### **Conclusion**

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). *Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).*

*A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.*

*The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.*

*U.S. Patent 6,483,327 issued to Bruce et al teaches time-resolved detection of photoemissions in integrated circuit testing.*

*U.S. Patent 5,528,156 issued to Ueda et al teaches IC analysis by photoemission detection.*

*"Failure Analysis of ULSI circuits Using Photon Emission", Y. Uraoka, IEEE Log Number 9211664, IEEE 1993 – teaches IC analysis by photoemission detection.*



*"The Attack of the 'Holey Shmoos': A Case Study of Advanced DFD and Picosecond Imaging Circuit Analysis (PICA)", W. Huott, ITC International Test Conference, IEEE, January 1999 – teaches IC analysis by PICA.*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

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